

### REMARKS

By this amendment, claim 163 has been amended. Claims 1-9, 12, 14-25, 27-36, 38, 40, 44-53, 56, 58-69, 71-82, 84, 88-89, 91, 95, 97-98, 100-108, 111-113, 115, 117-120, 122, 126-133, 136-140, 142-145, 147, and 151-163 are pending in the application. Applicants reserve the right to pursue the original claims and other claims in this and other applications.

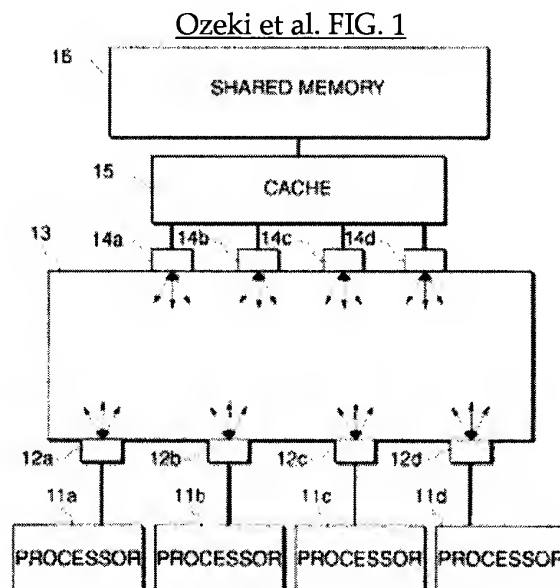
Claims 1-5, 12, 14, 27-29, 31, 35, 44, 73, 75-76, 79, 89, 91, 95, 97-98, 100-104, 117, 120, 126-129, 142, and 145 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ozeki et al. (US 6,651,139) in view of Hung (US 2001/0015837). This rejection is respectfully traversed. Neither Ozeki et al. nor Hung, even when considered in combination, teaches or suggests all of the limitations of independent claims 1, 89, 95, 101, or 126.

Claim 1 recites a memory system comprising, *inter alia*, “a memory controller; at least one memory storage device connected to a memory bus; a continuous optical path coupled to said memory controller and to said memory bus arranged and configured for exchanging data between said memory controller and said at least one memory storage device, said optical path comprising a first wavelength-adjustable electro-optical converter” (emphasis added). Claims 89, 95, 101, and 126 recite similar limitations. Applicants respectfully submit that Ozeki et al. and Hung, even when combined, fail to teach or suggest these limitations.

To the contrary, Ozeki et al. teaches that “light signal level control unit 29 is installed ... so as to enable the communication of the signal with an arbitrary light intensity.” Col. 6, ln. 26-28 (emphasis added). Applicants respectfully submit that Ozeki et al. does not disclose, teach, or suggest an optical path comprising a first wavelength-

adjustable electro-optical converter, as recited in claims 1, 89, 95, 101, and 126. Nor is Hung cited for these limitations. Hung teaches that the multiple wavelength laser 1362 provides only "reference optical signals for generation and assignment of optical channels," and not data to be stored in a memory. Paragraph [0044]; Abstract. Thus, Hung does not remedy the deficiencies of Ozeki et al.

In addition, Ozeki et al. teaches in FIG. 1 (reproduced below) that the shared memory 16 is connected to a cache memory 15, and not to a memory bus. No memory bus is taught at all by Ozeki et al. Applicants respectfully submit that Ozeki et al. does not disclose, teach, or suggest a memory bus and a continuous optical path coupled to said memory controller and to said memory bus, as recited in claim 1. Hung is not cited for, nor does it teach, these limitations. Hence, Hung does not remedy the deficiencies of Ozeki et al.



Furthermore, regarding claims 89, 101, and 126, the Office Action does not even assert that Ozeki et al. teaches all the limitations of these claims, nor does it assert that Hung teaches the missing limitations.

Claim 89 recites an electro-optical converter for a memory system comprising, *inter alia*, "at least one wavelength-adjustable device arranged and configured to convert said electrical data signal to an optical signal; at least one optical output arranged and configured to transmit said optical signal into an optical path coupled directly to a memory module, said optical output, optical path and memory module being formed on a single die; and a wavelength sensing mechanism connected to said controller arranged and configured to provide wavelength information to said controller with respect to the optical signal." All of these limitations are omitted from the Office Action's rejection, partially or completely.

Claim 101 recites a method of operating a memory system comprising, *inter alia*, "converting said electrical signal output from said controller to an optical signal for transmission on an optical path, said conversion step further comprising adjusting the wavelength of said optical path; ... and providing wavelength information to said controller with respect to the optical signal on said optical path, said memory module, optical path and memory controller being formed on a single die." All of these limitations are omitted from the Office Action's rejection, partially or completely.

Claim 126 recites a method of operating a memory system comprising, *inter alia*, "receiving an electrical signal output from at least one memory storage device; converting said electrical signal output from said memory storage device to an optical signal for transmission on an optical path, said conversion step further comprising adjusting the

wavelength of said optical signal; transmitting said optical signal over an optical path to a memory controller controlling said at least one memory storage device; and providing wavelength information to said controller with respect to the optical signal on said optical path, said memory storage device, optical path and memory controller being formed on a single die." All of these limitations are omitted from the Office Action's rejection, partially or completely.

Since the combination of Ozeki et al. and Hung does not teach or suggest all of the limitations of claims 1, 89, 95, 101, and 126, claims 1, 89, 95, 101, and 126 are not obvious over the cited combination. Claims 2-5, 12, 14, 27-29, 31, 35, 44, 73, 75-76, 79, 91, 97-98, 100, 102-104, 117, 120, 127-129, 142, and 145 depend, respectively, from independent claims 1, 89, 95, 101, and 126, and are patentable at least for the reasons mentioned above, and on their own merits. Applicants respectfully request that the 35 U.S.C. § 103(a) rejection of claims 1-5, 12, 14, 27-29, 31, 35, 44, 73, 75-76, 79, 89, 91, 95, 97-98, 100-104, 117, 120, 126-129, 142, and 145 be withdrawn and the claims allowed.

Claims 6-8, 24-25, 30, 32-34, 36, 38, 10, 45-51, 53, 58, 68-69, 71-85, 88, 106-107, 115, 118-119, 122, 131-132, 139-140, 144, 147, 151, 155, and 159 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ozeki et al. in view of Hung and Acton et al. (US 5,544,319). This rejection is respectfully traversed.

Claim 45 recites limitations similar to claims 1, 89, 95, 101, and 126. Ozeki et al., Hung, and Acton et al., even when considered in combination, fail to teach or suggest all of the limitations of independent claim 45. As set forth above, the Ozeki et al. and Hung combination does not teach or suggest the limitations of these claims. Moreover, Acton et

al., cited as teaching a processor, does not cure the above-discussed deficiencies of the Ozeki et al. and Hung combination.

Since Ozeki et al., Hung, and Acton et al. do not teach or suggest all of the limitations of claim 45, claim 45 and dependent claims 46-51, 53, 58, 68-69, 71-85, 88, and 155 are not obvious over the cited combination. Claims 6-8, 24-25, 30, 32-34, 36, 38, 10, 106-107, 115, 118-119, 122, 131-132, 139-140, 144, 147, 151, and 159 depend, respectively, from independent claims 1, 89, 95, 101, and 126, and are patentable at least for the reasons mentioned above, and on their own merits. Applicants respectfully request that the 35 U.S.C. § 103(a) rejection of claims 6-8, 24-25, 30, 32-34, 36, 38, 10, 45-51, 53, 58, 68-69, 71-85, 88, 106-107, 115, 118-119, 122, 131-132, 139-140, 144, 147, 151, 155, and 159 be withdrawn and the claims allowed.

Claims 9, 15-23, 52, 59-67, 108, 111-113, 133, 136-138, 152-154, 156-158, and 160-163 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ozeki et al. in view of Hung, Acton et al., and Fee (US 6,658,210). This rejection is respectfully traversed. Claim 163 recites limitations similar to claims 1, 45, 89, 95, 101, and 126. Ozeki et al., Hung, and Acton et al., even when considered in combination, fail to teach or suggest all of the limitations of independent claim 163. Fee, cited as teaching a WDM optical system, does not cure the above-discussed deficiencies of the Ozeki et al., Hung, and Acton et al. combination.

Moreover, the Supreme Court recently said in *KSR Int'l Co. v. Teleflex Inc.* that “the [Graham] factors continue to define the inquiry that controls” a finding of obviousness and reiterated that a “patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art.” 127 S. Ct.

1727, 1734 (U.S. 2007). The Graham factors include determining the scope and content of the prior art, ascertaining differences between the prior art and the claims at issue, and resolving the level of ordinary skill in the pertinent art. *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966).

Applicants submit that the Office Action has not properly shown that the Applicants' claims would have been obvious by conducting an examination of the Graham factors. "Patent examiners carry the responsibility of making sure that the standard of patentability enunciated by the Supreme Court and by the Congress is applied in each and every case." M.P.E.P. § 2141. Instead, to show that Ozeki et al., Acton et al., and Fee may be combined and that the Applicants' claims are obvious in light of these references, the Office Action merely states that it would be obvious to combine the references to allow "the optical signals [to] transmit[] back and forth over a[] bidirectional optical link and allow multi-wavelengths to communicate via [a] single fiber or wave guide." Office Action at p. 10. This statement is not an adequate substitution for an analysis of the Graham factors and does not show obviousness. In fact, the Office Action does not even offer a reason for adding Hung into the asserted Ozeki et al., Acton et al., and Fee combination.

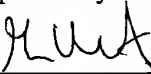
In addition, the "requisite prior art suggestion to combine becomes less plausible when the necessary elements can only be found in a large number of references. . . ." *Eli Lilly & Co. v. Teva Pharms. USA, Inc.*, 2004 U.S. Dist. LEXIS 14724 at \*104; 2 *Chisum on Patents* § 5.04[1][e][vi]. In the present application, the lack of any identifiable objective reason to combine the four references, in addition to the sheer number of disparate references applied by the Office Action, is sufficient to overcome the asserted obviousness arguments.

Since Ozeki et al., Hung, Acton et al., and Fee do not teach or suggest all of the limitations of claim 163, claim 163 is not obvious over the cited combination. Claims 9, 15-23, 52, 59-67, 108, 111-113, 133, 136-138, 152-154, 156-158, and 160-162 depend, respectively, from independent claims 1, 45, 101, and 126, and are patentable at least for the reasons mentioned above, and on their own merits. Applicants respectfully request that the 35 U.S.C. § 103(a) rejection of claims 9, 15-23, 52, 59-67, 108, 111-113, 133, 136-138, 152-154, 156-158, and 160-163 be withdrawn and the claims allowed.

In view of the above, Applicants believe the pending application is in condition for allowance.

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Respectfully submitted,

By  #41,198

Thomas J. D'Amico

Registration No.: 28,371

Rachael Lea Leventhal

Registration No.: 54,266

DICKSTEIN SHAPIRO LLP

1825 Eye Street, NW

Washington, DC 20006-5403

(202) 420-2200

Attorneys for Applicants